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Aphids of Alberta

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SUMMARY

A list of 147 species of aphids found in Alberta is given with the recorded hosts. Generic and specific names conform to currently accepted usage in aphid taxonomy. The aphids found on each host in Alberta, twelve species of aphid parasites, and two species of hyperparasites are listed.

RÉSUMÉ

L'auteur énumère 147 espèces de pucerons que l'on trouve en Alberta, avec leurs hôtes connus. Les noms génériques et spécifiques sont conformes à l'usage actuellement établi en taxinomie des pucerons. Les pucerons infestant chaque hôte en Alberta, douze espèces parasites et deux espèces hyperparasites, sont répertoriés.

INTRODUCTION

Ancient Aphids

Aphids have been present since ancient times. A few years ago an aphid was found embedded in clear amber in the tailings of an open-pit coal mine near Medicine Hat, Alberta. The bentonite that overlaid the amber-bearing coal was determined radiometrically to be about 72 million years old. Fossils of five other species of aphids have been found in amber on the shores of Cedar Lake, Manitoba (Richards 1966). Fossil aphids have also been found in England and Denmark. Those from Denmark were in amber calculated to be 35-50 million years old (Heie 1967). Obviously, aphids have survived for million of years and probably will survive for many more.

Identification

It is difficult to accurately determine how many kinds of aphids there are in the world as many new species are being described each year. However, it has been estimated that there are over 3000 known species.

One of the major problems with aphid research is the accurate determination of species. The sugarbeet root aphid can be used to illustrate some of the complications of identification. This aphid, which has been studied in Alberta, overwinters either as an egg on poplar trees or as a wingless insect in the soil. When the egg hatches, a yellow to dusky-green aphid emerges and begins to feed on the poplar leaf. As it feeds, it forms a gall around itself. The wingless aphid in the gall has a pair of antennae, each of which has four segments. The offspring that she produces are dull-green to black, with wings and six-segmented antennae. They leave the gall and fly to sugarbeets where they produce wingless, white to yellowish aphids with five-segmented antennae that live on sugarbeet roots.

The wingless aphids continue to produce wingless forms like themselves on sugarbeets until late summer, when they produce dark-colored winged aphids with six-segmented antennae. These fly back to poplars where they produce small wingless yellow males and females whose antennae have four segments. These, in turn, mate and each female lays an egg in a crevice in the bark of a tree to complete the cycle.

We thus have four wingless forms and two winged forms of aphid, which all look different but all belong to the same species. To complicate matters more, the wingless aphid that hatches from the egg looks more like several other species of aphid that cause poplar galls than its own offspring that migrate to sugarbeets. The winged form, in turn, looks more like the migrants of other closely related species of aphid than its own mother or its own offspring.

To solve problems of aphid identification it is often necessary to know a great deal about the biology of the species and, conversely, a thorough knowledge of aphid identification is necessary for the satisfactory solution of biological and control problems.

Biology and Reproduction

Aphids are prolific. Their population can increase rapidly under favorable conditions of temperature and moisture. They have the unusual ability to produce living young without mating during most of the year. Most species lay eggs only in autumn. The young that hatch from the eggs in spring produce living female young that, without mating, can soon produce new female offspring. These, in turn, produce other female young.

Since this type of reproduction is repeated many times during the season, aphid populations can increase very rapidly. One scientist calculated that, under ideal conditions, the weight of the progeny from a single aphid could, within a year, equal the weight of the human population of China. Fortunately, this does not happen.

Damage

Aphids are among the world's most destructive insect pests. They vary in color and may be red, pink, yellow, brown, green, purple, or black. They reduce the vigor and yield of plants, contaminate edible parts, transmit destructive plant diseases and kill plants if the infestation is great. Disease transmission varies with species. For example, the pea aphid transmits 27 plant diseases, the potato aphid 35, and the green peach aphid over 100. Although some diseases are transmitted by aphids in Alberta, few cause serious problems.

Most species of aphids have a narrow host range but some, like the peach aphid and the black bean aphid, attack many different plants. There are some problem aphids present in Alberta. The peach aphid may need to be controlled in greenhouses and on potatoes. The pea aphid damages pea and alfalfa plants and may also carry the spores of the alfalfa verticillium wilt pathogen, *Verticillium albo-atrum*. Several species of grain aphids infest grasses, cereals, and cover crops in Alberta. They may transmit the virus that causes barley yellow dwarf, a disease that seriously affects cereals. The most severe infestation of grain aphids in Alberta occurred in 1956 when the corn leaf aphid, *Rhopalosiphon maidis* (Fitch), destroyed 110 000 ha of barley in the province. The sugarbeet root aphid, *Pemphigus betae* Doane, has caused serious problems to sugarbeets in Alberta and in the late forties and early fifties was the limiting factor for sugarbeet production. During that period, some fields yielded less than 12.5 tonnes/ha, which was well below production costs. Fortunately, although 147 species of aphids have been found in Alberta, only a few are serious pests.

Control

Natural control plays an important role in restricting aphid populations. Many factors including temperature, humidity, air movement, land and water barriers, parasites, predators, and diseases help to reduce aphid populations.

When natural control proves inadequate, aphids can seriously damage crops and action must be taken to control them. They may be controlled by growing resistant varieties, controlling irrigation or watering, modifying cultural practices, introducing parasites, predators, and aphid diseases, and applying insecticides. Often two or more of these in combination may be needed.

Although many aphids attack crops, all species cannot be controlled in the same way. In developing controls for aphids it is necessary to consider the biology of the aphids and the insects associated with them, the nature of the host crops involved, the environmental factors affecting the aphid and each crop, and disease transmission by the aphids. All control methods used should control the aphids without seriously affecting the environment.

Alberta Aphids

This paper reports on aphids that the authors have collected in Alberta. The generic and specific names used are those given by Smith and Parron (1978). Synonymy of the aphids can be found in Eastop and Hille Ris Lambers (1976). To identify aphids from Alberta the most valuable source is Palmer (1952). Quist (1978) published a revised list of the Aphids of the Rocky Mountain Region which incorporates the nomenclatural modifications that permit individuals to check the correctness of the names in Palmer's book.

Because of the diversity of flora in Alberta there are many species of aphids found in the province. Alberta is comprised of approximately 661 183 km^2 and extends from latitude 49° to latitude 60°N, a distance of 1216 km. The west boundary follows the Continental Divide in the Rocky Mountains to latitude 54°, then follows longitude 120° to latitude 60°. The east boundary is longitude 110°. The province varies in width from 291 to 646 km.

Ecological and phytophysical features of vegetation have been reviewed by Moss and Packer (1983). The four major physical divisions in the province are plains (87%), mountains, foothills, and the precambrian area in the extreme northeast of the Province. The altitude of the province varies from 198 m above sea level in the northeast corner to about 3656 m above sea level on the highest mountains. In general, the climate of Alberta is representative of continental regions of northern latitude, being characterized by low annual precipitation and great extremes of temperature. The average number of frost-free days decreases from 120 in the south to 60 in the north.

Agriculturally, the province can be divided into the drier ranching areas in the south and southeast, the more moist ranching areas along the foothills, the cereal-growing areas of the prairies and parkland, and the irrigated areas in the south where forages, row crops, and cereals are grown.

Strickland (1953) published some notes on aphids of Alberta, but we have been unable to find some of the species he recorded. Nor can we confirm identifications of certain other species because some of his slides have been lost and others do not contain appropriate taxonomic features. Our list includes the 147 species of aphids arranged alphabetically by genera, followed by the names of the host plants. For the botanical names the references used were Budd's Flora of the Canadian Prairie Provinces (Looman and Best 1979), Flora of Alberta (Moss and Packer 1983), and Hortus Third (Bailey et al. 1976).

APHIDS AND HOST PLANTS

Acyrthosiphon caraganae (Cholodkovsky 1907). *Caragana arborescens.*

Acyrthosiphon lactucae (Passerini 1860). *Lactuca sativa.*

Acyrthosiphon macrosiphum (Wilson 1912). *Amelanchier florida.*

Acyrthosiphon pisum (Harris 1776). *Medicago sativa, Melilotus alba, Melilotus officinalis, Pisum sativum, Vicia faba.*

Acyrthosiphon (Metopolophium) *dirhodum* (Walker 1849). *Avena sativa,* Gramineae.

Amphorophora rubi (Kaltenbach 1843). *Rubus idaeus.*

Aphis armoraciae Cowen 1895. *Tragopogon dubius* (roots).

Aphis citricola van der Goot 1912. *Cotoneaster* sp., *Sorbus americana, Spiraea vanhouttei.*

Aphis fabae Scopoli 1763. *Beta vulgaris, Cirsium arvense, Dahlia* sp., *Phaseolus vulgaris, Philadelphus lewesii, Rheum rhaponticum.*

Aphis farinosa Gmelin 1790. *Salix* sp.

Aphis gossypii Glover 1877. *Monarda fistulosa.*

Aphis helianthi Monell 1879. *Cirsium vulgare, Cornus stolonifera, Helianthus annuus.*

Aphis maculatae Oestlund 1887. *Populus tremuloides.*

Aphis oenotherae Oestlund 1887. *Epilobium angustifolium.*

Aphis pomi DeGeer 1773. *Pyrus baccata.*

Aphis sambuci Linnaeus 1758. *Sambucus nigra.*

Aphis varians Patch 1914. *Ribes hirtellum.*

Aphthargelia symphoricarpi (Thomas 1878). *Symphoricarpos occidentalis.*

Aulacorthum solani (Kaltenbach 1843). *Pelargonium* sp.

Brachycaudus (Acaudus) *cardui* (Linnaeus 1758). *Prunus cistena.*

Brachycaudus helichrysi (Kaltenbach 1843). *Anthemis tinctoria, Chrysanthemum* sp.

Brevicoryne brassicae (Linnaeus 1758). *Brassica oleracea, Brassica rapa.*

Cavariella aegopodii (Scopoli 1763). *Anethum graveolens, Daucus carota.*

Cavariella pastinacae (Linnaeus 1758). *Heracleum lanatum.*

Cavariella theobaldi (Gillette and Bragg 1918). *Salix* sp.

Chaitophorus balsamiferinus Hille Ris Lambers 1960. *Populus* sp.

Chaitophorus essigi Gillette and Palmer 1928. *Populus tremuloides, Populus* sp.

Chaitophorus nigrae Oestlund 1886. *Salix* sp.

Chaitophorus populicola Thomas 1878. *Populus sargentii, Populus tremuloides, Populus angustifolia.*

Chaitophorus saliciniger (Knowlton 1927). *Salix* sp.

Chaitophorus stevensis Sanborn 1904. *Populus tremuloides.*

Cinara apini (Gillette and Palmer 1924). *Pinus flexilis.*

Cinara banksiana Pepper and Tissot 1955. *Pinus banksiana.*

Cinara braggii (Gillette 1917). *Picea glauca.*

Cinara brevispinosa (Gillette and Palmer 1924). *Pinus contorta.*

Cinara canatra Hottes and Bradley 1953. *Pinus contorta.*

Cinara chinookiana Hottes 1955. *Abies lasiocarpa.*

Cinara coloradensis (Gillette 1917). *Picea glauca.*

Cinara confinis (Koch 1856). *Abies balsamea.*

Cinara cupressi (Buckton 1881). *Juniperus* sp.

Cinara curvipes (Patch 1912). *Abies balsamea.*

Cinara fornacula Hottes 1930. *Picea glauca.*

Cinara hottesi (Gillette and Palmer 1924). *Picea glauca.*

Cinara juniperi (DeGeer 1773). *Juniperus communis.*

Cinara laricifex (Fitch 1858). *Larix laricina.*

Cinara lyallii Bradley 1956. *Larix lyallii.*

Cinara medispinosa (Gillette and Palmer 1929). *Pinus contorta.*

Cinara murrayanae (Gillette and Palmer 1924). *Pinus contorta.*

Cinara obscura Bradley 1953. *Picea glauca.*

Cinara ontarioensis Bradley 1962. *Pinus banksiana.*

Cinara oregonensis (Wilson 1915). *Pinus contorta.*

Cinara pergandei (Wilson 1919). *Pinus banksiana.*

Cinara pinea (Mordvilko 1895). *Pinus sylvestris.*

Cinara piniradicis Bradley 1959. *Pinus contorta.*

Cinara pinivora (Wilson 1919). *Pinus contorta.*

Cinara pruinosa (Hartig 1841). *Picea glauca.*

Cinara pseudotaxifoliae Palmer 1952. *Pseudotsuga menziesii.*

Cinara pseudotsugae (Wilson 1912). *Pseudotsuga menziesii.*

Cinara sabinae (Gillette and Palmer 1924). *Juniperus* sp.

Cinara spiculosa Bradley 1956. *Larix* sp.

Cinara subterranea Bradley 1956. *Larix laricina.*

Cinara vandykei (Wilson 1919). *Picea engelmanni.*

Cinara villosa Gillette and Palmer 1931. *Pinus flexilis.*

Cryotomyzus ribis (Linnaeus 1758). *Ribes diacanthum.*

Dysaphis tulipae (Boyer de Fonscolombe 1841). *Gladiolus sp. (roots).*

Epameibaphis frigidae (Oestlund 1886). *Artemisia sp.*

Eriosoma americana (Riley 1879). *Ulmus americana.*

Erisoma herioti Borner 1952. *Ulmus americana.*

Erisoma lanigerum (Hausmann 1802). *Ulmus americana.*

Erisoma rileyi Thomas 1877. *Ulmus americana.*

Euceraphis gillettei Davidson 1915. *Betula pendula.*

Euceraphis punctipennis (Zetterstedt 1828). *Betula papyrifera.*

Eulachnus agilis (Kaltenbach 1843). *Pinus compacta.*

Eulachnus rileyi (Williams 1911). *Pinus* sp.

Forda marginata Koch 1857. *Bromus inermis.*

Geoica utricularia (Passerini 1856). *Gramineae* (roots).

Hayhurstia atriplicis (Linnaeus 1761). *Chenopodium album.*

Hyperomyzus lactucae (Linnaeus 1758). *Sonchus arvensis, Sonchus arvensis* var *glabrescans, Sonchus uliginosus, Ribes* sp.

Hypermyzus (Neonasonovia) *ribiellus* (Davis 1919). *Ribes* sp.

Illinoia brevitarsis (Gillette and Palmer 1933). *Clematis* sp.

Kakamia alpina (Gillette and Palmer 1928). *Castilleja* sp.

Kakimia essigi (Gillette and Palmer 1929). *Aquilegia* sp.

Kakamia robinsoni Richards 1958. *Delphinium* X *pacifica.*

Kakimia wahinkae (Hottes 1933). *Delphinium* sp.

Liosomaphis berberidis (Kaltenbach 1943). *Berberis thunbergii.*

Lipaphis erysimi (Kaltenbach 1843). *Descurainia sophia, Brassica rapa.*

Macrosiphoniella ludovicianae (Oestlund 1886). *Artemisia ludoviciana.*

Macrosiphum albifrons Essig 1911. *Lupinus* sp.

Macrosiphum californicum (Clarke 1903). *Salix* sp.

Macrosiphum euphorbiae (Thomas 1878). *Rosa* sp., *Phaseolus vulgaris, Erythronium grandiflorum, Linum usitatissimum.*

Macrosiphum kiowanepus (Hottes 1933). *Zygadenus elegans.*

Macrosiphum valerianiae (Clark 1903). *Epilobium angustifolium.*

Macrosiphum (Sitobion) *avenae* (Fabricius 1775). *Avena sativa.*

Macrosiphum (Sitobion) *insularis* subsp. *yagasogae* Hottes 1948. No host.

Maculolachnus submacula (Walker 1848). *Rosa* sp.

Meliarhizophagus fraxinifollii (Riley 1879). *Fraxinus pennsylvanica.*

Mindarus abietinus Koch 1857. *Abies balsamea, Picea glauca, Picea* sp.

Mordvilkoja vagabunda (Walsh 1863). *Populus acuminata, Populus sargentii.*

Myzaphis rosarum (Kaltenbach 1843). *Potentilla fruticosa.*

Myzocallis (Neomyzocallis) *punctatus* (Monell 1879). *Quercus macrocarpa.*

Myzus cerasi (Fabricius 1775). *Prunus pensylvanica.*

Myzus (Nectarosiphon) *persicae* (Sulzer 1776). *Ageratum houstenianum, Brassica napus, Brassica oleracea, Brassica rapa, Celosia cristata, Centaurea cineraria, Chrysanthemum* sp., *Dianthus caryophyllus, Helianthus annuus, Lobularia maritima, Matthiola incana, Phaseolus vulgaris, Salvia splendens, Tagetes patula, Viola tricolorhortensis, Vicia faba.*

Nearctaphis bakeri (Cowen 1895). *Medicago sativa.*

Nearctaphis sensoriata (Gillette and Bragg 1918). *Amelanchier alnifolia.*

Nearctaphis yohoensis Bradley 1965. *Sorbus* sp.

Ovatus crataegarius (Walker 1850). *Mentha spicata.*

Pachypappa sacculi (Gillette 1914). *Populus tremuloides.*

Pachypappa tremulae (Linnaeus 1761). *Populus tremuloides.*

Pemphigus betae Doane 1900. *Beta vulgaris* (roots), *Chenopodium album, Populus angustifolia, Populus balsamifera.*

Pemphigus bursarius (Linnaeus 1758). *Populus nigra var italica, Lactuca sativa.*

Pemphigus junctisensoriatus Maxson 1934. *Populus sargentii.*

Pemphigus monophagus Maxson 1934. *Populus balsamifera.*

Pemphigus nortonii Maxson 1934. *Populus sargentii.*

Pemphigus populicaulis Fitch 1859. *Populus sargentii.*

Pemphigus populiglobuli Fitch 1859. *Populus angustifolia, Populus balsamifera.*

Pemphigus populiramulorum Riley 1879. *Populus sargentii.*

Pemphigus populitransversus Riley 1879. *Populus sargentii.*

Pemphigus populivenae Fitch 1859. *Populus angustifolia, Populus balsamifera.*

Periphyllus brevispinosus Gillette and Palmer 1930. *Acer glabrum.*

Periphyllus negundinis (Thomas 1878). *Acer negundo.*

Pleotrichophorus glandulosus (Kaltenbach 1846). *Artemisia frigida.*

Prociphilus americanus (Walker 1852). *Fraxinus pennsylvanica.*

Prociphilus (Neoparacletus) *corrugatans* (Sirrene 1894). *Amelanchier alnifolia.*

Prociphilus nr *fraxinidipetalae* Essig. *Fraxinus pennsylvanica.*

Pterocomma bicolor (Oestlund 1887). *Salix* sp.

Pterocomma populifoliae (Fitch 1851). *Populus angustifolia, P. tremuloides.*

Pterocomma pseudopopuleum Palmer 1952. *Populus angustifolia.*

Pterocomma salicis (Linnaeus 1758). *Salix* sp.

Pterocomma smithiae (Monell 1879). *Salix* sp.

Rhopalosiphum cerasifoliae (Fitch 1855). *Prunus virginiana.*

Rhopalosiphum maidis (Fitch 1856). *Avena sativa, Hordeum vulgare, Triticum aestivum, Zea mays.*

Rhopalosiphum padi (Linnaeus 1758). *Avena sativa, Bromus inermis, Hordeum vulgare, Prunus padus, P. trilobata, Secale cereale, Triticum aestivum, Triticale* sp.

Schizaphis graninum (Rondani 1852). *Avena sativa, Hordeum vulgare, Triticum aestivum.*

Symydobius americanus (Baker 1918). *Betula pendula.*

Tetraneura ulmi (Linnaeus 1758). *Gramineae* (roots).

Tetraneura ulmisacculi Patch 1910 (Migrant). *Lycopersicon esculentum.*

Thecabius affinis (Kaltenbach 1843). *Populus balsamifera, Populus* sp.

Thecabius (Parathecabius) *gravicornis* (Patch 1913). No host.

Thecabius (Parathecabius) *populimonilis* (Riley 1879). *Populus balsamifera, P. angustifolia.*

Therioaphis maculata (Buckton 1900). *Medicago sativa.*

Tinocallis ulmifolii (Monell 1879). *Ulmus americana.*

Trama rara Mordvilko 1908. *Taraxacum officinale* (roots).

Uroleucon rudbeckiae (Fitch 1851). *Solidago canadensis, Rudbeckia hirta.*

Ureleucon sp. *Solidago canadensis.*

Uroleucon (Uromelan) *eoessigi* (Knowlton 1947). *Althaea rosea.*

Uroleucon (Uromelan) *taraxaci* (Kaltenbach 1843). *Taraxacum officinale.*

Utamphorophora crataegi (Monell 1879). *Crataegus succulenta.*

HOST PLANTS AND APHIDS

Abies balsamea (L.) Mill. — Balsam fir
- *Cinara confinis*
- *Cinara curvipes*
- *Mindarus abietinus*

Abies lasiocarpa (Hook.) Nutt. — Alpine fir
- *Cinara chinookiana*

Acer negundo L. — Manitoba maple, Box elder
- *Periphyllus negundinis*

Ageratum houstenianum Mill. — Flossflower
- *Myzus persicae*

Alfalfa - see *Medicago*

Althaea rosea Cav. — Hollyhock
- *Uroleucon eoessigi*

Amelanchier alnifolia Nutt. — Saskatoon berry
- *Prociphilus corrugatans*
- *Nearctaphis sensoriatus*

Amelanchier florida Lindl. — Serviceberry
- *Acyrthosiphon macrosiphum*

Anethum graveolens L. — Dill
- *Cavariella aegopodii*

Anthemis tinctoria L. — Golden marguerite
- *Brachycaudus helichrysi*

Aquilegia X *hybrida* — Columbine
- *Kakimia essigi*

Artemisia frigida Willd. — Pasture sage
- *Pleotrichophorus glandulosus*

Artemisia ludoviciana Nutt. *Macrosiphoniella ludovicianae*	Prairie sage
Artemisia sp. *Epameibaphis frigidae*	Sagebrush, wormwood
Ash - see *Fraxinus*	
Avena sativa L. *Acyrthosiphon dirhodum* *Macrosiphum avenae* *Rhopalosiphum maidis* *Rhopalosiphum padi* *Schizaphis graminum*	Oats
Barberry - see *Berberis*	
Barley - see *Hordeum vulgare*	
Bean - see *Phaseolus vulgaris*	
Beet - see *Beta*	
Berberis thunbergii D.C. *Liosomaphis berberidis*	Japanese barberry
Bergamot - see *Monarda*	
Beta vulgaris L. *Aphis fabae* *Myzus persicae* *Pemphigus betae*	Garden beet, sugar beet Swiss chard
Betula papyrifera Marsh *Euceraphis punctipennis*	White birch, paper birch
Betula pendula Roth *Symydobius americanus*	Cutleaf weeping birch
Betula sp. *Euceraphis gilletti*	Birch
Birch - see *Betula*	
Box elder - see *Acer negundo*	
Brassica napus L. *Myzus persicae*	Rapeseed
Brassica oleracea L. *Brevicoryne brassicae* *Myzus persicae*	Cabbage, kale, cauliflower

Brassica rapa L. — Turnip
Brevicornye brassicae
Myzus persicae
Lipaphis erysimi

Broadbean - see *Vicia faba*

Brome - see *Bromus*

Bromus inermis Leyss. — Smooth brome
Forda marginata
Rhopalosiphum padi

Cabbage - see *Brassica oleracea*

Camas - see *Zygadenus*

Canada thistle - see *Cirsium arvense*

Caragana arborescens Lam. — Common caragana
Acyrthosiphon caraganae

Carnation - see *Dianthus caryophyllus*

Carrot - see *Daucus carota*

Castilleja sp. — Indian paintbrush
Kakamia alpina

Cauliflower - see *Brassica oleracea*

Celosia cristata (L.) O.Kuntze — Cockscomb
Myzus persicae

Centaurea cineraria L. — Dusty miller
Myzus persicae

Chenopodium album L. — Lambsquarters
Hayhurstia atriplicis
Pemphigus betae

Chokecherry - see *Prunus virginiana*

Chrysanthemum X morifolium Ramat — Chrysanthemum
Brachycaudus helichrysi
Myzus persicae

Cirsium arvense (L.) Scop. — Canada thistle
Aphis fabae

Cirsium vulgare (Savi) Tenore — Bull thistle
Aphis helianthi Monell

Clematis jackmanni Moore *Illinoia brevitarsis*	Virgin's bower
Columbine - see *Aquilegia*	
Corn - see *Zea mays*	
Cornus stolonifera Michx *Aphis helianthi*	Red osier dogwood
Cotoneaster sp. *Aphis citricola*	Cotoneaster
Cottonwood - see *Populus*	
Cow parsnip - see *Heracleum lanatum*	
Crabapple - see *Pyrus baccata*	
Crataegus succulenta Link *Utamphorophora crataegi*	Hawthorn
Dahlia X *unwin* *Aphis* fabae	Dahlia
Dandelion - see *Taraxacum officinale*	
Daucus carota L. *Cavariella aegopodii*	Carrot
Delphinium X *pacifica* *Kakimia robinsonii* *Kakimia wahinkae*	Larkspur
Descurainia sophia (L.) Webb *Lipaphis erysimi*	Flixweed
Dianthus caryophyllus L. *Myzus persicae*	Carnation
Dill - see *Anethum graveolens*	
Dogwood - see *Cornus*	
Douglas fir - see *Pseudosuga menziesii*	
Dusty miller - see *Centaurea cineraria*	
Elder - see *Sambucus*	
Elm - see *Ulmus*	

Epilobium angustifolium L. — Fireweed
- *Aphis oenotherae*
- *Macrosiphum valerinaiae*

Erythronium grandiflorum Pursh — Glacier lily
- *Macrosiphum euphorbiae*

Fir - see *Abies*

Flax - see *Linum*

Flixweed - see *Descurainia*

Flossflower - see *Ageratum*

Flowering almond - see *Prunus trilobata*

Fraxinus pennsylvanica Marsh — Green ash
- *Meliarhizophagus fraxinifolii*
- *Prociphilus americanus*
- *Prociphilus* nr *fraxinidipetale*

Geranium - see *Pelargonium hortorum*

Glacial lily - see *Erythronium grandiflorum*

Gladiolus sp. — Gladiolus
- *Dysaphis tulipae*

Goat's beard - see *Tragopogon*

Goldenglow - see *Rudbeckia lanciniata*

Goldenrod - see *Solidago canadensis*

Gooseberry - see *Ribes hirtellum*

Gramineae — Grass
- *Acyrthosiphon dirhodum*
- *Geoica utricularia*
- *Tetraneura ulmi*

Grass - see Gramineae

Hawthorn - see *Crataegus*

Helianthus annuus L. — Sunflower
- *Aphis helianthi*

Helianthus sp. — Sunflower
- *Myzus persicae*

Heracleum lanatum Michx — Cow parsnip
- *Carvariella pastinacae*

Hollyhock - see *Althaea rosea*

Hordeum vulgare L. — Barley
Macrosiphum avenae
Rhopalosiphum maidis
Rhopalosiphum padi
Schizaphis graminum

Horse mint - see *Monarda fistula*

Indian paintbrush - see *Castilleja*

Japanese barberry - see *Berberis thunbergii*

Juniper - see *Juniperus*

Juniperus communis L. — Mountain juniper
Cinera junipera

Juniperus sp. — Juniper
Cinara cupressi
Cinara sabinae

Kale - see *Brassica*

Lactuca sativa L. — Lettuce
Acyrthosiphon lactucae
Pemphigus bursarius

Lambsquarters - see *Chenopodium album*

Larch - see *Larix*

Larix lyallii Parl. — Alpine larch
Cinara spiculosa

Larkspur - see *Delphinium*

Lettuce - see *Lactuca sativa*

Linum usitatissimum L. — Common flax
Macrosiphum euphorbiae

Lobularia maritima (L.) Desv. — Sweet alyssum
Myzus persicae

Lupinus sp. — Lupine
Macrosiphum albifrons

Lycopersicum esculentum L. — Tomato
Tetraneura ulmisacculi

Manitoba maple - see *Acer negundo*

Marguerite - see *Anthemis*

Mattiola incana (L.) R. Br. — Stocks
Myzus persicae

Mayday tree - see *Prunus padus*

Medicago sativa L. — Alfalfa
Acyrthosiphon pisum
Nearctaphis bakeri
Therioaphis maculata

Melilotus alba Medic — White sweet clover
Acyrthosiphon pisum

Melilotus officinale (L.) Pall. — Yellow sweet clover
Acyrthosiphon pisum

Mentha spicata L. — Mint
Ovatus crataegarius

Mint - see *Mentha spicata*

Mock orange - see *Philadelphus lewsii*

Monarda fistulosa L. — Wild bergamot, horse mint
Aphis gossyppi

Mountain ash - see *Sorbus*

Oak - see *Quercus*

Oats - see *Avena sativa*

Pansy - see *Viola*

Pea - see *Pisum sativum*

Pelargonium hortorum — Cultivated geranium
Aulacorthum solani

Phaseolus vulgaris Metz — Bean
Aphis fabae
Macrosiphum euphorbiae
Myzus persicae

Philadelphus lewsii Pursh. — Mock orange
Aphis fabae

Picea engelmannii Parry — Engelmann spruce
Cinara vandykei

Picea glauca (Moench) Vos *Cinara braggi* *Cinara coloradensis* *Cinara fornacula* *Cinara hottesi* *Cinara pruinosa* *Cinara obscura* *Mindarus abietinus*	White spruce
Picea sp. *Mindarus abietinus*	Spruce
Pin cherry - see *Prunus pensylvanica*	
Pine - see *Pinus*	
Pinus banksiana Lamb *Cinara banksiana* *Cinara ontarioensis* *Cinara pergandei*	Jack pine
Pinus contorta Dougl. *Cinara brevispinosa* *Cinara canatra* *Cinara medispinosa* *Cinara murrayanae* *Cinara pinivora* *Cinara oregonensis*	Lodgepole pine
Pinus flexilis James *Cinara apini* *Cinara villosa*	Limber pine
Pinus mugo Turra *Eulachnus agilis*	Mugo pine
Pinus sylvestris L. *Cinara pinea*	Scotch pine
Pinus sp. *Eulachnus rileyi*	Pine
Pisum sativum L. *Acyrthosiphon pisum*	Garden pea
Plains cottonwood - see *Populus sargentii*	
Poplar - see *Populus*	
Populus acuminata *Mordvilkoja vagabunda*	Lanceleaf cottonwood

Populus angustifolia James *Chaitophorus populicola* *Pemphigus betae* *Pemphigus populiglobuli* *Pemphigus populivenae* *Ptercomma populifoliae* *Ptercomma pseudopopulum*	Narrowleaf cottonwood
Populus balsamifera L. *Pemphigus betae* *Pemphigus monophagus* *Pemphigus populiglobuli* *Pemphigus populivenae* *Thecabius affinis* *Thecabius populimonilis*	Balsam poplar
Populus nigra var *italica* Muench *Pemphigus bursarius*	Lombardy poplar
Populus sargentii Dode *Mordvilkoja vagabunda* *Pemphigus junctisensoriatus* *Pemphigus nortonii* *Pemphigus populicaulis* *Pemphigus populiramulorum* *Pemphigus populitransversus*	Plains cottonwood
Populus tremuloides Michx *Aphis maculatae* *Chaitophorus populifolii* *Chaitophorus populicola* *Chaitophorus stevensis* *Pachypappa sacculi* *Pachypappa tremulae* *Pterocomma populifoliae*	Trembling aspen, aspen poplar
Populus sp. *Chaitophorus balsamiferinus* *Chaitophorus essigi* *Thecabius affinis*	Poplar
Potentilla fruticosa L. *Myzaphis rosarum*	Shrubby cinquefoil
Prunus cistena N. E. Hansen *Brachycaudus cardui*	Purple leaved plum
Prunus padus L. *Rhopalosiphum padi*	Mayday tree, bird cherry
Prunus pensylvanica L. F. *Myzus cerasi*	Pin cherry

Prunus trilobata Lindl. *Rhopalosiphum* padi	Flowering almond
Prunus virginiana L. *Rhopalosiphum cerasifoliae*	Choke cherry
Pseudotsuga menziesii (Mirb.) Franco *Cinara pseudotaxifoliae* *Cinara pseudotsugae*	Douglas fir
Purple leaved plum - see *Prunus cistena*	
Pyrus baccata L. *Aphis pomi*	Crabapple
Quercus macrocarpa *Myzocallis punctatus*	*Oak*
Rapeseed - see *Brassica napus*	
Raspberry - see *Rubus*	
Rheum rhaponticum L. *Aphis fabae*	Rhubarb
Rhubarb - see *Rhuem rhaponticum*	
Ribes hirtellum Michx *Aphis varians*	Gooseberry
Ribes diacanthus Pall. *Cryptomyzus ribis* *Hyperomyzus ribiellus*	Red currant
Rosa sp. *Macrosiphum euphorbiae* *Maculolachnus submacula*	Rose
Rose - see *Rosa*	
Rubus idaeus L. *Amphorophora rubi*	Wild red raspberry
Rudbeckia laciniata L. *Uroleucon rudbeckiae*	Golden glow
Rye - see *Secale cereale*	
Sage - see *Artemisia*	

Salix sp. — Willow
- *Aphis farinosa*
- *Cavariella theobaldi*
- *Chaitophorus saliciniger*
- *Macrosiphum californicum*
- *Pterocomma bicolor*
- *Pterocomma salicis*
- *Pterocomma smithiae*

Salvia splendens F. Sellow — Scarlet sage
- *Myzus persicae*

Sambucus nigra L. — Golden elder
- *Aphis sambuci*

Saskatoon berry - see *Amelanchier alnifolia*

Scarlet sage - see *Salvia splendens*

Secale cereale L. — Rye
- *Rhopalosiphum padi*

Shrubby cinquefoil - see *Potentilla fruticosa*

Snowberry - see *Symphoricarpos*

Solidago canadensis L. — Goldenrod
- *Uroleucon nigrotuberculatum*
- *Uroleucon rudbeckiae*

Sonchus arvensis L. — Perennial sow thistle
- *Hyperomyzus lactucae*

Sonchus uliginosus Bieb. — Smooth perennial sow thistle
- *Hyperomyzus lactucae*

Sorbus americana Marsh — Mountain ash
- *Aphis citricola*

Sorbus sp.
- *Nearctaphis yohoensis*

Spiraea vanhouttei (Briot) — Spirea
- *Aphis citricola*

Spruce - see *Picea*

Stocks - see *Mattiola*

Sugarbeet - see *Beta vulgaris*

Sunflower - see *Helianthus*

Sweet alyssum - see *Lobularia*

Sweet clover - see *Melilotus*

Swiss chard - see *Beta vulgaris*

Symphoricarpos occidentalis Hook — Western snowberry
Aphthargelia symphoricarpi

Tagetes patula L. — Marigold
Myzus persicae

Taraxacum officinale Weber — Dandelion
Trama rara
Uroleucon taraxaci

Tomato - see *Lycopersicum esculentum*

Tragopogon dubius Scop. — Goat's beard
Aphis armoraciae (roots)

Trembling aspen - see *Populus tremuloides*

Triticum aestivum L. — Wheat
Acyrthosiphon dirhodum
Macrosiphum avenae
Rhopalosiphum maidis
Rhopalosiphum padi
Schizaphis graninum

Triticale sp. — Triticale
Rhopalosiphum padi

Turnip - see *Brassica rapa*

Ulmus americana L. — American elm
Erisoma americana
Erisoma herioti
Eriosoma lanigerum
Eriosoma rileyi
Tinocallis ulmifolii

Vicia faba L. — Broadbean
Acyrthosiphon pisum
Myzus persicae

Viola tricolorhortensis D.C. — Common pansy
Myzus persicae

Virgin's bower - see *Clematis*

Wheat - see *Triticum aestivum*

Willow - see *Salix*

Wormwood - see *Artemisia*

Zea mays L. — Corn
Rhopalosiphum maidis
Rhopalosiphum padi

Zygadenus elegans Pursh — Smooth camas
Macrosiphum kiowanepus

No host
Macrosiphum insularis subsp. *yagasogae*
Thecabius gravicornis

PARASITES AND HOST APHIDS

Aphidius avenaphis (Fitch). *Myzus persicae, Rhopalosiphon padi.*

Aphidius ervi Haliday. *Acyrthosiphon pisum.*

Aphidius matricariae Haliday. *Rhopalosiphon padi.*

Aphidius pulcher Baker. *Acyrthosiphon pisum.*

Aphidius smithi Sharma and Subba Roa. *Acyrthosiphon pisum.*

Aphidius sp. *Macrosiphum avenae, Macrosiphum albifrons.*

Asaphes fletcheri (Crawford). *Ovatus crataegarius.*

Asaphes semiflavus Howard. *Rhopalosiphum padi.*

Asaphes vulgaris Walker. *Acyrthosiphon pisum.*

Praon pequodorum Vierck. *Acyrthosiphon pisum.*

Praon prob. *exoletum palitans* Muesebeck. *Therioaphis maculata.*

Zysiphlebus salicaphis (Fitch). *Chaitophorus populicola.*

HYPERPARASITES AND HOSTS

Asaphes suspensus (Nee). *Aphidius smithi.*

Dendrocerus (Lygocerus) *niger* (Howard). *Aphidius smithi.*

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